



Australian Bureau of Statistics

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ANNUAL SEASONAL REANALYSIS

INTRODUCTION

The annual seasonal reanalysis of the Labour Force series was conducted on estimates up to February 2015. The seasonally adjusted and trend estimates in this issue reflect adjustments made as a result of this reanalysis.

While combined seasonal factors for the complete time series are estimated each month, the parameters and prior corrections are reviewed annually at a more detailed level than is possible in the monthly processing cycle. The annual seasonal reanalysis takes into account each additional year's original data and assesses the appropriateness of seasonal adjustment parameters and prior corrections. The average absolute revisions to seasonally adjusted and trend estimates arising from the 2015 annual seasonal reanalysis were small but larger than those seen in recent annual seasonal reanalyses. This is a result of applying specific adjustments for the changed pattern of supplementary surveys to the entire Labour Force series.

WHAT IS SEASONAL ADJUSTMENT?

The Labour Force data are collected monthly or quarterly using the same methods and definitions resulting in an original monthly or quarterly time series.

Seasonal adjustment is applied to some of the original series to remove influences that are:

- systematic and calendar related, for example school leavers joining the labour force every February; or
- systematic and related to holidays which move around between months but which still occur every year, for example Easter.

Systematic and calendar related influences which have the same timing, same direction and similar magnitude every year, are removed to create the seasonally adjusted series. The presence and size of influences due to moving holidays, the variable timing of the commencement of interviews in January and the timing of supplementary surveys are estimated using a regression-ARIMA framework and also removed. The regression-ARIMA framework enables these influences to be accurately estimated. Without accurate estimation of these effects, the seasonal pattern may be obscured, and the seasonal factors may be less accurate.

The seasonally adjusted series are then smoothed to create the trend series. Seasonally adjusted and trend series are revised each month to take account of the latest original estimates.

The ABS aims to produce high quality seasonally adjusted estimates that are without systematic related variation. These series can be used to better inform month-to-month comparisons.

Seasonally adjusted aggregate hours worked estimates include more extensive corrections for the influence of public holiday and school holiday effects. Each moving holiday is estimated and removed in the aggregate state/territory estimates. State/territory level influences are used to estimate the school and public holiday effects in the Australia and full-time/part-time by sex estimates.

During each annual seasonal reanalysis, the framework for estimating moving holidays and variable timing of the commencement of interviews in January is assessed for appropriateness. This is to ensure that the impact of these influences are being appropriately estimated from year to year, that assumptions used in the regression-ARIMA framework continue to be valid, and to implement improvements in estimation methodology.

REMOVING THE EFFECT OF SUPPLEMENTARY SURVEYS

In common with similar countries (e.g. Canada), responses to the main Labour Force Survey are affected to some extent by the supplementary surveys conducted by the ABS in conjunction with the Labour Force Survey. The effects vary, depending on the topics covered by the supplementary surveys and their length. For many years, most of these supplementary surveys were run in the same month each year. As a result, any effects on the original Labour Force estimates caused by having different supplementary surveys in different months had been largely removed from the seasonally adjusted estimates by the seasonal adjustment process.

In late 2014, the ABS systematically assessed the effects of each supplementary survey on the seasonally adjusted Labour Force estimates, including aggregate monthly hours worked. Significant effects were found for some supplementary surveys, with little or no measurable impact caused by others. As a result of this analysis, an approach was developed to re-estimate the seasonality of the Labour Force data with specific adjustments made for the changed pattern of supplementary surveys. This approach was adopted for the October 2014 Labour Force release for most seasonally adjusted series, and the December 2014 Labour Force release for aggregate monthly hours worked.

Prior to the 2015 annual seasonal reanalysis, these adjustments were applied to Labour Force series (other than aggregate monthly hours worked) for the period December 2013 onwards only. These adjustments for the effect of supplementary surveys have now been applied, where necessary, to the entire time series from February 1978.

The independent technical review into the Labour Force Survey in 2014 recommended a review of aspects of the methodology adopted to account for the effects of supplementary surveys including:

- Validating the timing of supplementary surveys included in the model. This was completed prior to the commencement of the 2015 annual seasonal reanalysis and the results incorporated into the reanalysis.
- Implementing the methodology for estimates prior to December 2013. This has been completed and the methodology to account for the effects of supplementary surveys has been applied to the Labour Force time series back to February 1978.
- Independently estimating the adjustments for all state/territory level series. The investigation demonstrated that independently estimating adjustments at the state/territory level did not yield superior results to the current methodology of using the Australia level adjustment as a proxy. This reflects that state/territory estimates are more variable than the comparable Australian level estimates and supplementary survey effects can not be as reliably identified. As a result, no change to the methodology for estimating the adjustments at the state/territory level has been made.
- Adjusting the weight applied to each supplementary survey based on the proportion of the

Labour Force sample responding (as opposed to sample selected). While the investigation into this refinement has not been completed, initial analysis indicates that this does not have a significant impact on the adjustments. This will be further considered as part of the 2016 annual seasonal reanalysis.

In addition to the revisions due to the annual seasonal reanalysis, the adjustment for the February 2015 supplementary survey was re-estimated taking into account the additional observation for March 2015. This contributed to the impact, describe below, observed for the February 2015 data.

IMPACT ON THE LABOUR FORCE DATA

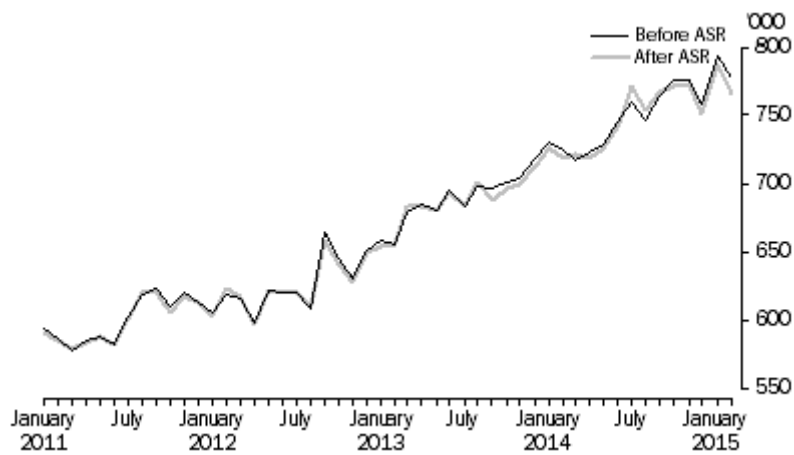
The overall impact of the annual seasonal reanalysis (including the revision described above to the adjustment for the February 2015 supplementary survey) on the Labour Force data for the period February 1978 to February 2015 was, for the most part, minimal.

The seasonally adjusted employed persons level series changed by an average absolute monthly value of 5,200 persons, with the largest revision of 60,300 persons occurring in July 1991. This revision is attributable to the adjustment to account for the changed timing of the Weekly Earnings of Employees supplementary survey which was conducted in July 1991 instead of the usual August month due to that year's Census of Population and Housing. Revisions include the impact of both the normal seasonal adjustment process and the results of the annual seasonal reanalysis. The employed persons trend series changed by an average absolute monthly value of 3,900 persons.



The unemployed persons seasonally adjusted level series for the period February 1978 to February 2015 changed by an average absolute monthly value of 1,800 persons, with the largest revision of 15,600 persons occurring in July 1983. The unemployed persons trend series changed by an average absolute monthly value of 1,200 persons.

Unemployed persons, Seasonally adjusted



FURTHER INFORMATION

For any queries regarding the annual seasonal reanalysis contact Labour Force Estimates on Canberra 02 6252 6525, or via email at labourforce@abs.gov.au or Time Series Analysis Section on Canberra 02 6252 6345 or via email at time.series.analysis@abs.gov.au.

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